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NEW THREAT TO NATIONAL SECURITY:

ENVIRONMENTAL DETERIORATION

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Planet earth is 4,600 million years old. If we condense this inconceivable time-span into an understandable concept, we can liken Earth to a person 46 years of age. Nothing is known about the first 7 years of this person's life; only scattered information exists about the middle span; only at age 42 did Earth begin to flower. Dinosaurs and the great reptiles did not appear until one year ago; mammals arrived only 8 months ago; in the middle of last week man-like apes evolved into ape-like men, and at the weekend the last ice age enveloped the Earth. Modern man has been around for 4 hours. During the last hour Man discovered agriculture. The industrial revolution began a minute ago. During those sixty seconds of biological time, Modern Man has made a rubbish pile of paradise.

-- Greenpeace

The future is purchased by the present.

--Samuel Johnson

Open, O Lord, the eyes of all people to behold thy gracious hand in all thy works, that, rejoicing in thy whole creation, they may honor thee with their substance, and be faithful stewards of thy bounty.

-- The Book of Common Prayer

INTRODUCTION

Since the mid 1960s, "national security" has been conceptualized in almost strictly military terms, rooted in the assumption that the principal threat to security comes from the military actions of other nations. Such was not always the case. While U.S. government efforts to define a national security strategy, such as NSC-68, in the years immediately following World War II had a strong military component, there was also a focus on economic, resource, political and psychological questions. Paradoxically, during the 1960's, as the memories of World War II faded, government efforts to define national security strategy came to be dominated by the Department of

Defense, and focused exclusively on military concerns. Consideration of military threats, particularly from the Soviet Union and Warsaw Pact countries, has become so dominant that new threats to U.S. security, such as economic and environmental threats which military forces cannot address and may in fact exacerbate, tend to be ignored.[1]

A profoundly important reality of our age is interdependence. Economically this interdependence is illustrated by the effect of the industrialized nations' trade and debt policies on the lives of billions of people in the developing world; by interlinked financial markets; by the effect of agricultural policies of one nation on people far distant. Similarly, scientific research shows with increasing clarity the interrelationships governing our planet's ecology.

Unprecedented increases in both population and economic activity have caused severe pollution and pressure on natural resources. The world's population, which has doubled since World War II, will reach 6 billion by the year 2000. The gross world product has increased fourfold since 1950. The world is following a course which erodes many of our most basic resources. In some cases, such as land and water, we are living off the principal and have been for some time. The deterioration of the global environment is on a scale that encompasses the major life-supporting systems of the earth's biosphere. It includes the exhaustion of soils, loss of forests, alteration of

the earth's climate and biogeochemical cycles, the accumulation of hazardous and radioactive wastes, and the decline of ecological communities.

In a recent Foreign Affairs article, George F. Kennan wrote that "our world is at present faced with two unprecedented dangers: any major war at all among great industrial powers and the devastating effect of modern industrialization and overpopulation on the world's natural environment."[2] The threat from worldwide environmental degradation to our nation's ability to survive with its current values and standard of living intact is as important, if perhaps less obvious, as the threat from large-scale war.

Although environmental deterioration threatens the security of all nations by undermining the resource support systems on which human activity and economic well-being depend, most countries are doing little to preserve their environmental security. In 1986, for example, the U.S. spent about $275 billion on military defense but only $18 billion to address environmental threats which are as concrete and potentially as devastating as our perceived military threat.[3]

In January 1988, the White House published The National Security Strategy of the United States, which declares that U.S. strategy seeks to assure and protect five key national interests: (1) the survival of the United States as a free and independent nation, with its fundamental values intact and its institutions and people secure;

(2) a healthy and growing U.S. economy to provide opportunity for individual prosperity and a resource base for our national endeavors;

(3) a stable and secure world, free of major threats to U.S. interests;

(4) the growth of human freedom, democratic institutions, and free market economies throughout the world, linked by a fair and open international trading system; and

(5) healthy and vigorous alliance relationships.

"America's national security and economic strength are indivisible," the document continues. "As the global economy evolves in increasingly interdependent ways, we must be aware of economic factors that may affect our national security, now or in the future."[4]

Although the link between a strong economy and national security is often asserted, our national security strategy and the decision-making structure of the National Security Council continue to focus almost exclusively on military concerns. Economic questions, such as how we can sustain our resource base, are left for other government agencies, which seem to address them, if at all, in a haphazard and fractured manner. There is, in fact, no one person on the NSC staff who is assigned to focus on the environmental dimensions of national security.[5]

If a nation's environment is degraded and its resources depleted, its economy will decline, its social cohesion will deteriorate and political instability will mount, so that the

potential for internal or international conflict will increase. My paper will first address environmental threats resulting from regional deterioration of such basic natural resources as land, forests and water which affect developing countries most severely. I shall highlight the intertwining consequences of overpopulation, deforestation, soil erosion and water problems, and explain how these regional problems all have an impact, direct or indirect, on the United States. Secondly, I shall assess four environmental threats to the developed world, examining in more detail one of those four, the depletion of the ozone layer, by means of a framework used to address military threats. Thirdly, I shall discuss obstacles that stand in the way of successful national and international measures to deal with the threats, and finally, I shall offer a plan of action the U.S. government could undertake to regain leadership in this area.

I REGIONAL ENVIRONMENTAL ISSUES IN NATIONAL SECURITY

Population growth lies at the core of most environmental concerns, yet at present only 1% of worldwide development aid and less than 1% of developing countries' budgets is spent on population programs.[6] More than 90% of the one billion increase in world population expected in the next decade will take place in the developing world. This means that by the year 2000 only 20% of the world's population will live in the developed countries, with obvious implications for North/South issues, Third World debt, development assistance, insurgencies,

and tottering democracies. When a state's population expands faster than its natural resource base can sustain, and faster than its government and other institutions can accommodate, the usual result is not only decreasing supplies of food, water, forests, and energy, but also declining provisions for health, education, and employment.

A prime example is black Africa, whose population is growing at rates of 2.5-3%. The increased number of people has caused subsistence farmers to cultivate non-traditional farmlands leading to the massive destruction of soil cover, grasslands and forests. The resulting impoverishment has led to an unprecedented number of refugees. (Africa, with less than 10% of the world's population, has more than one-half of the world's refugees, whose numbers have grown from less than 1 million in 1970 to 10 million in 1985; many of these displaced Africans -- 500,000 in Sudan, for example -- have been explicitly recognized as environmental refugees.)

Ethiopia's experience is illustrative: population pressures combined with rudimentary agricultural practices led to massive losses of topsoil in the traditional farming areas. There was a marked decline in agricultural production, with resulting food shortages in the cities, which contributed to the overthrow of Emperor Haile Selassie in 1974. Masses of peasants migrated to the Ogaden region. Because of similar conditions in neighboring Somalia, many Somalis were also migrating to these Ogaden lowlands. Caused in part by these populations searching for a

means of livelihood, in 1977 open hostilities began which soon involved the direct interests of both superpowers. It is estimated that over a five-year period, well over $1 billion was spent in the Horn of Africa because of the Ogaden clash.[7] The timely investment of a fraction of this sum in reforestation and in education on proper agricultural practices might have prevented, or at least would have ameliorated, these disastrous consequences. Even smaller sums if invested much earlier in effective population control programs, would have paid great dividends. Instead, "projections based on factors of the natural resource base, agricultural land capacity, etc., indicate that 'black' Africa's enfamished throngs could more than double to reach 65 million by the year 1990, and 130 million by the year 2000. In other words, the proportion of starving may well increase from under 7% today to more than 18% by the year 2000."[8] Human suffering and domestic unrest make countries ripe for subversion from within or without, or for authoritarian governments. Such developments obviously severely limit U.S. options and raise the cost of advancing our national interests, particularly for "a stable and secure world" and for "the growth of human freedom and democratic institutions."

Much closer to home is Mexico, with 87 million people and a rapidly growing population that is expected to reach 109 million by 2000. This growth, combined with environmental decline -- principally in depleted agricultural lands -- impels hundreds of thousands of Mexicans annually to emigrate to the U.S., legally

and illegally. Economic expansion cannot keep up with growth; in a 27 million work force in 1987, half were underemployed or unemployed. An estimated 11% of Mexico's labor force is now working illegally in the U.S. As the Mexican political scientist Jorge Castaneda wrote in the Fall 1986 issue of Foreign Policy, "the consequences of not creating nearly 15 million jobs in the next 15 years are unthinkable. The youths who do not find them will have only three options: the United States, the streets, or revolution."

Similarly, the U.S. is now the destination of most of the nearly 1 million "boat people" who have fled Haiti, causing significant costs to the U.S. government and to the state of Florida, as well as severe social frictions in their receiving communities. As Jessica Tuchman Mathews writes in an article to be published in the April 1989 Foreign Affairs, "many were forced into the boats by the impossible task of farming bare rock. Until Haiti is reforested, it will never be politically stable." Similarly, in other parts of the Caribbean, at least 2 million people are thought to have become environmental refugees, with 250,000 heading to the U.S. Rather than fleeing political persecution, they are fleeing the impossibility of eaking out a living in their homeland. Some sectors of the population, seeing no way out, turn to drug use and trafficking. Even in the more affluent Bahamas a recent poll of junior high schoolers reported that the profession most would choose to be when they grow up is a drug trafficker.

Population in Nepal has increased from 8 million in 1950 to 17 million today, while forest cover has declined to one-third of its previous level. Due to insufficient wood for fuel, many burn cattle-dung instead. The use of dung as fuel rather than as fertilizer leads to an average loss of 15% of the crop yield. The amount of food grain lost totals at least 20 million metric tons per year (worth some $3.5 billion), an amount that would feed 100 million people for one year and constitutes almost twice as much as all the food aid that was shipped in 1985."[9]

The problem of water supplies, again aggravated by *population* growth, has caused severe problems with significant security implications. Of 200 major river systems in the world, 140 are shared by two nations, and more than 40 by 3-10 nations. In all they support almost 40% of the world's population.[10] Deforestation in catchment zones (often at least in part driven by population growth) greatly increases the potential for conflict One result of the deforestation in Nepal mentioned above is that the annual flows of the Ganges River system are now characterized by flooding and subsequent reduced flows. The resulting damage is estimated to cost India (which owed foreign lenders $46.5 billion in 1987) at least $1 billion a year. Bangladesh, which shares the river basin, makes ever greater claims on the waters, causing major friction between the two nations. This river basin, which supported some 200 million people in 1950, must now support more than 500 million, a total that is projected to double within just 25 years.[11] The

reduced flow of the Indus has provoked similar water disputes between India and Pakistan, two nations whose relations are often at a flashpoint and who are both thought to have nuclear weapons.

Competition for water resources in the Middle East is more acute than any other part of the world.

> Israel consumes about five times as much water per capita as its less industrialized and intensively-farmed neighbors; and by 1990 Israel is expected to be suffering critical water deficits. The country went to war in 1967 in part because the Arabs were trying to divert the headwaters of the River Jordan. Israel now occupies the West Bank and the Golan Heights partially because it wishes to safeguard its access to the rivers catchment area.[12]

Israel restricts water use in the occupied West Bank and Gaza Strip, where the Palestinian compete for a resource that both peoples see as vital for survival -- and thus a potential source of major conflict. In Egypt too water is of great importance. President Sadat declared in 1978 "We depend upon the Nile 100%... it is a matter of life and death." His words were echoed in 1985 by Egypt's Foreign Minister, Butros Ghali, who stated: "The next war in our region will be over the waters of the Nile, not over politics... Washington does not take this seriously, because everything for the United States relates to Israel, oil and the Middle East." [13]

From the above statements we would expect the world's leaders to recognize water as one of the central issues they must address to reach a successful political solution in the Middle East. My research indicates, however, that U.S. policymakers have paid scant if any attention to this issue in spite of the massive amount of U.S. involvement and effort to try to resolve Middle East problems.

A good case can be made that the conflicts in Central America, which President Reagan considered an area where "the national

security of all the Americas is at stake," are largely the result of a combination of population growth, deforestation, soil loss and general deterioration of agricultural lands. El Salvador, politically the most unstable of Central American states, is also the most ecologically devastated, and has for decades exported a large percentage of its people. The large numbers of Salvadorans who migrated to Honduras in the 1960s (one-tenth of El Salvador's population at that time) was a direct cause of the so-called "Soccer War" of 1969. (The war resulted from the Salvadoran government's initiation of military action in response to Honduras' expulsion of thousands of Salvadorans from its territory. Although the war was quickly terminated by the Organization of American States, it disrupted hopes for regional economic integration.) El Salvador's future stability will be affected by a projected tripling of its population. According to a 1984 U.N. Food and Agriculture Organization estimate, the most the country could support, even if it were to undertake broadscale conservaton measures and high-technology agriculture, would be 14 million people; yet its population i expected to reach 17 million. Moreover, a 1982 Agency for International Development report states:

> The fundamental causes for the present conflict are as much environmental as political, stemming from problems of resource distribution in an overcrowded land... almost complete deforestation, massive soil erosion and loss of fertility, siltation threatening hydropower developments, largescale extinction of flora and fauna, diminished groundwater resources, deteriorating water quality, and widespread health-threatening environmental pollution.[14]

The examples of regional deterioration in the developing world that I have discussed all have implications for international relations, and at least indirectly for U.S. national security since

they all contribute to political instability and economic disruption. The NSC and other policymakers should address them in a timely fashion. Indeed, both superpowers must move away from the competitive course pursued over the last 40 years at a terrible economic cost and price in world security to one of cooperation. It is difficult to decrease the perception of mutual military threat between the U.S. and the USSR (which could lead to curtailed military efforts and expenditures); however, identifying worldwide environmental deterioration as a common and potentially devastating threat to weakening economies and standard of living may provide the crucial catalyst necessary to enable the two ideological adversaries to move from the competitive military policies pursued since World War II to policies of increasing cooperation. This is one area where the superpowers clearly can cooperate to increase global security without fear of weakening their own national security.

II. FOUR ENVIRONMENTAL THREATS TO THE DEVELOPED WORLD

According to the Environment Protection Agency and the Central Intelligence Agency, there are four major environmental problems that are likely to affect directly the national security of the United States and our foreign relations with other developed and underdeveloped countries: (1) global warming, (2) acid precipitation, (3) hazardous and radioactive wastes, and (4) the depletion of the ozone layer.

Perhaps the most significant environmental threat to the entire world, although its effects will be deferred and diffuse, is the

climatic dislocation caused by "the greenhouse effect" and deforestation. There are so many variables to take into account in predicting results that there is no universally accepted model, nor even agreement that the phenomenon exists. There is growing evidence, however, that CO_2, caused principally by the burning of fossil fuels (3/4 of which derives from the industrialized countries), has increased in the atmosphere by 10% from 1960 to 1985, and perhaps by as much as 25% since 1900. Concurrently, there has been large-scale reduction in tropical forests each year -- an area the size of Tennessee is destroyed annually in order to expand agriculture and logging activities. These tropical forests are CO_2 "sinks", i.e., they absorb CO_2 from the atmosphere, typically over 50% of the world's production, and manufacture oxygen. Together these two phenomena combine to create the "greenhouse" effect, which some scientists predict will raise temperatures over land by about 8 degrees F. and cause melting of the polar ice caps. Some countries, such as the USSR, are likely to benefit from a global warming trend; most, including the United States, would suffer massive dislocations of agricultural production. Thus there are differing incentives to study and take remedial action.

The second environmental threat affecting the developed world is acid precipitation caused by excessive sulphur dioxide emissions. It results in increased acidification of lakes and rivers, and damage to forests. The American failure to decrease sulphur emissions has strained relations with Canada, our closest neighbor and largest trading partner, and the relations will

deteriorate even further if President Bush does not take prompt action. It is also a point of contention between West and East Germany, and between the United Kingdom and the Scandinavian countries.

The third environmental threat causing friction in the international arena is disposal of toxic wastes. This is primarily seen as a North/South issue, with the developed north, unwilling or unable to properly dispose of the hazardous wastes it creates, looking to corrupt or uninformed officials in the Third World to accept the exported wastes.

The fourth threat is the depletion of the protective ozone layer, which has frequently been in the news lately and which highlights many of the difficulties in dealing successfully with these new threats to national security. I will analyze this issue in more detail, employing the rationale used to assess military threats: (1) the nature of the threat; (2) our assumptions about the threat; (3) the risks of ignoring the threat; and (4) solutions and impediments to solutions. I will use the terms from this military analytic framework to make the case that this environmental menace, like others stemming from population growth and industrialization, represents a serious threat to our national security.

The nature of the threat. Through the use of two minor classes of chemicals, the chloroflourocarbons (or CFCs) and halons (a chemical used in fighting fires), we have created a continent-sized hole in the ozone layer at the top of the stratosphere and caused a

growing loss of ozone from that protective layer all around the planet. Until the mid 1970's, when some scientists began to predict the CFC/ozone depletion link, CFCs (widely used as coolants, blowing agents in rigid insulation foams, aerosol propellants, and solvents) were thought to be innocuous; they were neither toxic nor flammable at ground level, versatile, and inexpensive to produce. By 1987, however, scientists discovered that the average ozone concentration over the South Pole was down 50%. In March 1988, a report issued by more then 100 experts "reported that the ozone layer around the entire globe was eroding much faster than any model had predicted. Between 1969 and 1986, the average global concentration of ozone in the stratosphere had fallen by approximately 2%."[15]

As ozone in the upper atmosphere decreases, more ultraviolet radiation reaches the earth promoting skin cancers and cataracts, depressing human immune systems, reducing crop yields, depleting marine fisheries, increasing smog and materials damage. The global warming trend is thought to encourage the process. "The phenomenon is global and will affect the well-being of every person in the world."[16]

Our assumptions about the threat. Originally, most governments -- including the U.S. -- assumed (and hoped) that the predicted threat to the ozone layer, with the resulting increase in radiation and its consequences, would not materialize. Thus, rather than implement policies to decrease the potential threat governments merely called for continued study. Once the large ozone hole was

discovered, however, governments' assumptions quickly changed. The United Nations Environment Programme (UNEP) became a very effective multilateral force through which the Montreal Protocol on Substances that Deplete the Ozone Layer was negotiated and signed in 1987 by 35 countries. The agreement calls for a freeze on CFC Production (at 1986 levels) by 1989, a 20% decrease in production by 1993, and another 30% cut by 1998. Starting in 1992, halon production is subject to a freeze based on 1986 levels. The agreement was remarkable in that it was not a response to a disaster, such as Chernobyl or the recent oil spill in Alaska, but rather to the gradual building of an international scientific consensus fostered by UNEP and World Meteorlogical Organization. Signatory governments, including the United States, thereby indicated their concern that the threat from radiation is serious enough to require making economic sacrifices through reduced emissions of CFCs and halons, although the approach to such reductions varies greatly among nations and industries.

Unfortunately, even if achieved, these measures will not be sufficient to protect the ozone layer; they will simply retard, not arrest, its depletion. Although it is technically feasible to reduce CFC and halon emissions by 90% by 1995, governments will have to muster the political will to do so. "Many of these control strategies are already cost-effective," contends EPA, "and more will become so as regulations push up the price of ozone-depleting chemicals."[17] It is evident that the original assumption that the Montreal Protocol is all that is needed is not well-founded.

The risks of ignoring the threat. The effects of ozone layer depletion are already being felt by people now alive, and they will increase rapidly over the next 70 years. The U.S. Environmental Protection Agency (EPA) damage projections are that each 1% drop in ozone will result in 4-6% more cases of squamous and basal cell carcinoma, which translates into 3-15 million new cases in Americans born before 2075. From 500,000 to 2.8 million more Americans born before 2075 will suffer from cataracts than would have otherwise, and they will be stricken earlier in life. Medical research indicates that increased radiation will also depress the human immune system, lowering the body's ability to attack the development of tumors and making it more prone to infectious diseases.[18]

Increased radiation also affects terrestrial and aquatic ecosystems, decreasing photosynthesis, water-use efficiency, yield and leaf area. Rapid ozone depletion could overwhelm the capacity of these systems to evolve protective mechanisms. Decreases in commercial fish populations are almost certain to occur, and overfished areas may have even more difficulty rebuilding. This will have the greatest effect on Third World countries, many of which rely primarily on fish for their protein and which have inadequate health facilities.

There are many unanswered questions and additional research is needed. Unfortunately, the greatest uncertainty exists in the two areas where there is the most potential to harm our health and food supplies, e.g. the effects of increased UV-B radiation on the immune system and on aquatic and plant life. However, EPA studies have led

that agency to the conclusion that the benefits of limited future CFC/halon use far outweigh the increased costs these regulations would impose on the economy. "In the United States alone, the present value of the benefits of controlling emissons through the year 2075 is estimated at $6 trillion -- some 240 times greater than the costs." [19]

Solutions and impediments. We must stop producing CFCs and halons, and we must continue research on the causes and effects of ozone depletion. There are several significant obstacles to achieving these goals. Clearly there are costs associated with finding substitute, environmentally safe products, and in transitioning industry to use them. The major chemical companies indicate that $135 billion of equipment in the U.S. operates using CFCs, including 100 million home refrigerators, the air-conditioners in 90 million cars, and the central air-conditioning plants in 100,000 large buildings.[20] As already noted, however, EPA studies indicate the immediate costs are far smaller than the enormous long-term costs and consequences of no change.

Perhaps the greater difficulty will be in reaching international consensus on the measures needed. Representatives of 124 nations gathered in London in early March 1989 to discuss the threat. China and India, representing two-fifths of the world's population, refused to join the ban in producing CFCs until industrialized countries commit themselves to financial and technological aid to facilitate and offset the use of substitutes. (The CFC emissions of both of these countries could skyrocket -- China for example has

stated its goal of providing enough refrigerators so that every household can have one by the end of the century.) The USSR, which produces 10% of the world's CFCs, has refused to follow the lead of the US and the EEC in pledging a total phaseout of these chemicals by the year 2000 since Soviet scientists are not yet convinced that CFCs account for ozone depletion.[21]

In a similar vein, Brazil refused to attend an international environmental summit conference at The Hague in mid-March of this year at which ozone depletion and other global environmental problems were to be addressed, on the grounds that Brazil has already has been singled out for unfair criticism because of its failure to protect the Amazon rain forest. President Sarney "issued a fresh attack on intolerable meddling in Brazil's domestic affairs. 'We are masters of our destiny and will not permit any interference in our territory.'"[22] His position was backed by all of the other seven nations which share the Amazon forest.

III. BARRIERS TO ADDRESSING ENVIRONMENTAL THREATS SUCCESSFULLY

The preceeding paragraphs highlight the major difficulties in decreasing just one of the major environmental threats. There are many and significant difficulties in addressing other global environmental threats, beginning with the complexity of the interdependence of the ecological systems and the inexact scientific knowledge which we currently possess. We lack both crucial knowledge and early warning systems. Additionally, the threats are difficult to quantify precisely. This is compounded by the impossibility of effectively addressing such global issues merely with statistics from individual nation states.

Global environmental threats pose new dilemmas for national sovereignty. Activities and decisions that in the past may have had only local consequences may now pose threats to the well-being of distant peoples and nations. These threats, which may cause governments to undertake actions in violation of the offending nation's "national sovereignty," raise serious new ethical questions and priorities. For example, should industrialized countries continue to emit increasing amounts of "greenhouse gasses" to meet their consumers desires at the risk of altering the planet's climate? Should China, with its need for energy for economic development, be permitted uncontrolled burning of its great coal reserves, which would contribute disproportionately to global warming? Should countries with significant tropical rainforests, such as Brazil and Indonesia, be permitted to continue to destroy these forests which play such a key role in the global climate? Should nations be allowed to pursue practices leading to mass extinction of species thereby diminishing potential technological advances in agriculture, medicine, and industry, all of which depend in varying degress on the genetic resources inherent in wild plants and animals? Are inadequate family planning programs in Haiti, Central America and Africa responsible for malnutrition, political instability and environmental refugees? Has the U.S. government contributed to the shortcomings of global family planning by allowing domestic politics to drastically reduce its support of proven effective programs in this domain during the past eight years?

Representatives of the 24 nations who met in The Hague at the environmental summit conference called for member states to endow

the United Nations with increased authority to police the global atmosphere. More importantly, they also called for "appropriate measures" to enforce its directives. They encouraged all nations to join in negotiating a new U.N. authority and to finance its operations."[23] In a similar vein, President Mikhail Gorbachev earlier proposed that the U.N. Trusteeship Council, which is no longer needed to oversee colonies, become a trustee for managing the global commons. But it appears that the world is still a long way from achieving widespread international support for a supranational organization with coercive powers. Meanwhile, the principal problems are growing geometrically, and a delay of another decade or two will likely upset some ecological balances irreparably.

Successfully addressing most of the serious environmental threats no doubt will engender a clash with vested economic interests. It is expensive to switch to new technologies, and no country wants to disadvantage its own industries. Systems will have to be devised to place all countries' industries at an equal disadvantage at the same time. We must recognize that the developing countries do not want to be deprived of the industrialization they see as crucial to their economic growth.

All of these complexities make it tremendously difficult for governments to confront ecological threats. In many cases, governments that do not wish to cope with the threats simply refuse to educate themselves and ignore them. Likewise it is more difficult for a government to focus on a long-term threat beyond the political tenure of its incumbent government even though it has more serious long-term implications than an immediate crisis that has

captured all of its attention and effort. Nor do leaders wish to cause increased anxiety or perhaps additional unrest among their peoples by calling attention to needed changes to respond to long-term threats. Yet it is the utmost in irony for a leader to proclaim, as did President Sadat of Egypt, that he will not cede one square meter of land to a foreign power while his government allows hundreds of square miles of topsoil to be swept away each year. In our own hemisphere, current agricultural practices put enough topsoil to cover the state of Missouri into the Mississippi River each year.

Fortunately, there are technical, scientific and economically feasible solutions to many current trends, and the right kinds of research should provide additional great payoffs. For example, opportunities for raising the efficiency of energy use in the United States that have already been identified cost from 1/2 to 1/7th the cost of new energy supplies. Agroforestry techniques are also now available that can replace the need for chemical fertilizers, improve soil quality, make more rainfall available, and provide fuelwood and higher crop yields at the same time.

The time is now propitious for a new beginning, a renewed emphasis on national and international action to rectify past policies or adopt new policies to address environmental and resource threats. President Bush campaigned on the importance he attaches to the environment. President Gorbachev has repeatedly called for large-scale international cooperation on these issues, most recently in his December 7, 1988, speech to the United Nations General Assembly. British Prime Minister Margaret Thatcher recently

proclaimed that "the health of the economy and the health of our environment are totally dependent upon each other. ... Protecting this balance of nature is therefore one of the great challenges of the late 20th century."[24] There are at least three reasons for increased government interest in this threat. First, there is more scientific evidence to substantiate them (e.g., drought in the Sahel; acid rain damage to the Black Forest; desertification in Ethiopia). Secondly, the USSR is using this issue as a means of asserting that it is a peaceful nation concerned about worldwide stability. Thirdly, since the U.S. was lax on pushing environmental regulations during the Reagan Administration, the Soviets have had the opportunity to take the moral high ground.

It is possible for governments, without inordinate expense, to take a systematic look at our planet and begin to address long-term environmental/population/resource threats. The Carter administration made a serious start in 1978 when the President directed "the Council on Environmental Quality and the Department of State, working in cooperation with... other appropriate agencies, to make a one year study of probable changes in the world's population, natural resources, and environment through the end of the century."[25] This study was to be the foundation of our longer-term planning.

The result of the President's directive was The Global 2000 Report to the President of the United States, a three volume study shepherded by an inter-agency executive group comprised of 13 government agencies; each agency contributed $50,000 to the budget and there was a total additional contribution of about $350,000 in

agency analysis and related work. The study was a projection of present trends out to the year 2000. As opposed to predicting what will occur, it depicted conditions that are likely to develop if there are no changes in public policies, institutions, or rates of technological advance, and if there are no wars or other major disruptions. Chapter 3, the Technical Report, synthesized and interpreted all of what was learned in reviewing and analyzing our government's present foundation for longer-term planning and analysis. Study Director Gerald Barney summarized the capabilities as follows:

> The fact of the matter is that one of the most powerful nations in the world is plunging ahead into the future with a vision of the world that is both myopic and astigmatic. This fact is even more alarming when one realizes that the United States probably has better data and better models than the vast majority of other nations in the world. The time has passed when the United States (or any other nation) can afford to base decisions affecting its future economic welfare and national security on an image of the world that is as distorted and out of focus as that produced by the U.S. agencies for the Global 2000 study.[26]

The central message of The Global 2000 Report was that according to the most knowledgeable professional analysts in the executive branch of the U.S. Government in 1979, if public policies around the world continue unchanged to the end of this century the number of serious world problems will increase and worsen. They also concluded that their projections are flawed in many ways and in all likelihood understate the gravity of the problems ahead. ("The Global 2000 Major Findings and Conclusions" is attached.)

President Carter and his administration undertook a major effort to bring the Global 2000 report to world leaders and to use its findings as "the foundation for our longer-term planning."

Regrettably, these efforts, which had just begun, were not continued by the Reagan Administration. The staff of the White House Council of Environmental Quality was drastically reduced. Most of our nation's efforts in international fora such as the OECD and the United Nations Environment Programme (UNEP) to encourage international responses to identified environmental threats were slowed down, stopped or reversed. Thus the United States not only lost its leadership role in this critical arena; it has lost credibility in the eyes of many nations as well. More importantly, the United States stance on domestic and international environmental issues has cost a decade which we can ill afford to lose.

Unfortunately, there is as yet no evidence of any systematic effort to focus on environmental concerns under the Bush Administration. Secretary of State James Baker's first speech, made just five days after assuming office, was to an international environmental conference addressing global climate change. In claiming global warming as his issue, he raised hopes that he would spearhead a worldwide effort to address the causes; "This is a transnational issue... We face more than simply a scientific problem. It is also a diplomatic problem of when and how we take action."[27] Thus far there has been no follow-up action. Baker's testimony before the House Foreign Affairs Committee regarding the International Agenda and FY 1990 Budget Request on February 21, 1989, contains no mention of global environmental concerns nor of funds needed in this area.[28] In fact, in spite of campaigning on an environmental plank, the administration is actually seeking to decrease U.S. contributions to the United Nations Environment

Programme, the only existing broad-based international organization capable of addressing global climate change, from $9.5 million in FY88 to $8 million in FY90.[29]

It is urgent that the national security apparatus of our government expand its consideration of immediate national security concerns beyond weapons, force structure, economic competition and diplomatic posturing to include sustainable national strength based on resource, environmental and demographic issues. National security is not just seeking temporary advantage in weapons and force structures, political and economic dealings. It relates as well to regional and global issues that rarely figure in the minds of military experts and political leaders. Addressing the latter in concern with other nations will require overcoming two major barriers which now impede mustering the capital and political will on the scale needed: (1) the allocation of capital to global military expenditures of $900 billion annually, and (2) the unmanageable debt that burdens Third World economies. A ecologically sound future requires that we deal with a series of interlocking issues simultaneously and globally. The momentum inherent in population growth, the forces of land degradation, and the changing chemistry of the atmosphere make it extremely difficult to get the world on a development path which can be sustained. The urgency and scale of these challenges require that they be moved to the center of government agendas.

V. CONCLUSIONS

There are four major ways the environmental threats addressed in this paper are likely to affect U.S. interests and national

security. The first of these is increasing North/South tensions. Developing nations, as evidenced by Brazil's President Sarney's stance on exploitation of the Amazon Basin, and the statements of China and India regarding CFCs, believe they can not forgo the advantages of industrialization, nor are they able to pay for environmental damage or costs for industrial transition to more environmentally safe products. In addition, the heavy debt burden carried by many Third World countries forces them to postpone concerns for their environment while mercilessly exploiting their natural resources to meet hard currency interest payments. Although they may seek "debt for nature" swaps, it is doubtful that many Third World governments would be able to live up to the obligations they contract in these arrangements. How can our globe be secure with 20% of the world's population living at America's current high standards, while 80% are on or below the margin?

Second, environmental threats are likely to increase disputes within the West's alliance. We have already seen examples of this in the acid rain tensions mentioned above. Another example is the failure of the organizers of the mid-March environmental summit conference held in The Hague (Norway, Holland and France) to invite the U.S. and some of the EC countries, which caused suspicions and strains with excluded countries.

Third, there will also be increased East/West tensions, as the two superpower alliance systems try to compete in world opinion over who is doing most to solve the problem. The subject has vast potential for exploitation by misinformation campaigns and the U.S. should expect that the USSR will not lose the opportunity to portray

the West in the worst light. Even more dangerous would be conflicts which could well arise over cross-border pollution. Tensions between the Central European and Scandinavian countries most affected by East European pollution are already evident, but essential international cooperation is in danger of failure on both sides. While conservative Communist leaderships in Czechoslovakia and East Germany follow policies of secrecy and obstruction on environmental issues, Western countries waver between lukewarm efforts at assistance and attempts to exploit East Europe's backwardness by using it as a site for waste and industrial projects no longer tolerated in the West.

Fourth, environmental issues are likely to cause internal tensions within the USSR, and between the USSR and the other Warsaw Pact nations, undermining Gorbachev's ability to effect much-needed reforms. Already the Baltic nations use "Russian-caused" environmental pollution to buttress their independence claims. Similar concerns stokes the nationalism of Siberia and Central Asia. If environmentally caused conflict were to erupt in Eastern Europe, the USSR might well find it necessary to intervene militarily, thereby prematurely ending the glasnost desired by the West.

V. ACTION PLAN

In her April 1989 Foreign Affairs article, Jessica Tuchman Mathews calls for three profound changes. The first would be to reinvent the national income accounts by which GNP is measured to take into account the resources a country is depleting in the economic practices it pursues in order to have a more accurate reflection of the full economic costs. Secondly, she sees an urgent

need for a set of indicators by which global environmental health can be measured, akin to the economic indicators such as GNP and unemployment rates. Thirdly, she calls on donors of development assistance to be mindful of the environmental consequences of their programs, and to search for better ways to turn the scientific and engineering strengths of the industrialized world to address the developing world's problems. The four programs she would put at the top of her agenda are the prompt revision of the Montreal Treaty on Ozone Depletion to eliminate CFC use by 2000; implementation of the global Tropical Forestry Action Plan developed by the World Bank, United Nations Development Programme, the Food and Agriculture Organization, and the World Resources Institute: sufficient support for family planning programs to ensure that all who want contraceptives have access to them; and (for the U.S.) a 10-year energy policy with the goal of increasing the energy efficiency of our economy by 3% per year (11% of the U.S. GNP is spent on energy, vs. only 5% in Japan).[30]

Ms. Mathews agenda has considerable merit. As an Action Plan for the U.S. government predicated upon it, I would recommend the following:

(1) Task and fund appropriate agencies of the U.S. government to focus on threats to our national security deriving from environmental degradation, similar to what DIA, CIA, State department, NSA and the military service intelligence services do on the military threat. We do not need a proliferation of intelligence and monitoring agencies,

but we do need to give ourselves the advantage of the most accurate and early information about the threat.*

(2) Upgrade the President's Council on Environmental Quality to be equal in importance and prominence to that of the Council of Economic Advisers, or alternatively, appoint an economist knowledgable in the link between economics and the environment to the Council of Economic Advisers. Now that environmental trends are shaping our economic future, intelligent policy-making requires that the highest quality information and advice be provided to the President in a timely and useable manner.

(3) Modify the National Security Council structure in such a way to ensure that environmental and resource-based concerns are factored into the decision-making process. In a recent conference at NDU, Harvard professor Sam Huntington (who has served twice as a consultant to the NSC with the personal commitment of ensuring that the NSC looks at security issues in a broader context) concluded it is too difficult for one body to incorporate all factors of the national security. He recommends instead that there be three separate but equal components of the NSC: one dealing with conventional and strategic defense; one with the relatively new focus on low-intensity conflict; and a third focused on economic issues.[32] The environmental and resource-based questions form part of our continued economic wellbeing and projection of strength, and could appropriately be addressed in this third NSC component.

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*Unfortunately, we seem to be moving in the opposite direction. The Bush Administration plans to remove government funding for the Landsat IV satellite, launched in 1976 under NASA control, imagery from which is used throughout the government to assess environmental and other data such as ocean pollution, crop predictions, advancing desertification, etc.[31]

(4) Pool the latest scientific knowledge about environmental indicators, with the purpose of presenting a coordinated picture of where we stand today. Such a compilation should also focus on the accuracy of models used in the Global 2000 report and other models used today, as well as how to achieve needed improvements to enable the government to be as accurate as possible in its long-term planning. The President should direct an inter-agency assessment of the actions the U.S. government and private sector should take, both nationally and internationally. He should also direct an existing U.S. government agency (the Council on Environmental Quality, EPA, or the NSC) to be responsible for ensuring that needed follow-up actions are taken. Such a structure would have to be appropriately staffed and financed and have strong, personal presidential backing to bring to bear the clout that will be necessary.

(5) Obtain presidential approval for the Department of State, through its Bureau of Oceans, Environment and Science, to take a leadership role in directing the attention of the international community towards these issues and to seek the unprecedented international cooperation that will be required to address them on the scale necessary. The Bureau would have to be greatly strengthened over what it is today. But the Department of State is the most logical coordinator for issues such as global climate change, now being handled by 17 U.S. government agencies, none of which has the lead responsibility for coordinating responses.

The global threats facing the world have so much momentum that unless steps are taken now to reverse them, they will soon overwhelm

our ability to respond. The status quo is on a fragile and deteriorating ecological base. Either societies will mobilize for change and begin moving toward a sustainable future or they will continue with business as usual, heading toward environmental deterioration and economic decline. With our scientific base and financial resources, the United States is in a position to launch the initiatives needed to secure a sustainable and prosperous future, as outlined by the five national interests enunciated by President Reagan and listed at the beginning of this paper. In addressing environmental concerns stated by President Gorbachev, we are in a position not only to respond favorably to the calls for international cooperation, but also to take new initiatives as well, thereby regaining a position of leadership and inspiration to the world community.

FOOTNOTES

[1] Samuel P. Huntington, speech at the National Defense University Symposium "The National Security Process: The Making of National Strategy for the 1990's and Beyond", December 1, 1989.

[2] George F. Kennan, "Containment Then and Now", Foreign Affairs, Vol. 65, No. 4 (Spring 1987), p. 889.

[3] Michael Renner, "Enhancing Global Security", State of the World 1989, (W.W. Norton & Company, New York, 1989), p. 141.

[4] National Security Strategy of the United States, (The White House, Washington, D.C., 1988), p. 1.

[5] Personal interview with Ambassador John Negroponte, former Deputy Director of the National Security Council, March 12, 1989.

[6] Norman Myers, "Population, Environment, and Conflict", Environmental Conservation, Vol. 14, No. 1, (Spring 1987), p. 21.

[7] Ibid, p. 21 (cites R. Luckham & D. Bekele, Review of African Political Economy).

[8] Ibid, p. 17.

[9] Ibid, p. 18 (cites J. Spears & E.S. Ayensu, The Global Possible: Resources, Development and the New Century).

[10] Norman Myers, "The Environmental Dimension to Security Issues", The Environmentalist, Vol. 6, No. 4 (1986), p. 251.

[11] Op. Cit., Myers, "Population, Environment, and Conflict", p. 19.

[12] Op. Cit., Myers, "The Environmental Dimension to Security Issues,", p. 252.

[13] Op. Cit, Myers, "Population, Environment, and Conflict", p. 19, (cites J. Starr, Egypt is African and Its Principal Problem Is Water, Center for Strategic & International Studies, Wash. D.C.)

[14] Agency for International Development report, 1982. (cited by Myers, op. cit., "The Environmental Dimension to Security Issues, p. 254).

[15] Cynthia Pollock Shea, "Protecting the Ozone Layer", State of the World 1989, (W.W. Norton & Company, 1989), p. 77.

[16] Ibid., p. 78.

[17] Ibid., p. 85.

[18] Ibid., p. 82.

[19] Ibid., p. 85.

[20] Malcolm W. Browne, "In Protecting the Atmosphere, Choices Are Costly and Complex," The New York Times, March 7, 1989, p. C1.

[21] Jonathan C. Randal, "Third World Demands Aid for CFC Reduction," The Washington Post, March 7, 1989, p. A7.

[22] Richard House, "Brazil Declines Invitation to Conference on Ecology," The Washington Post, March 4, p. A20.

[23] Edward Cody, "Global Environmental Power Sought," The Washington Post, March 12, 1989, p. A27.

[24] Margaret Thatcher, speech to the United Nations General Assembly, December 6, 1988, cited by Jessica T. Mathews, Foreign Affairs, April 1989 (not yet published).

[25] Gerald O. Barney, The Global 2000 Report to the President of the United States, Entering the 21st Century, Volume 1 (Pergamon Press 1980), p. xvi.

[26] Ibid., p. xiv.

[27] John M. Goshko, "Baker Urges Steps on Global Warming", The Washington Post, January 31, 1989, p. A6.

[28] James A. Baker, III, statement before the House Foreign Affairs Committee, February 21, 1989, "The International Agenda and FY 1990 Budget Request", U.S. Dept. of State, Current Policy No. 1147

[29] Ethan Schwartz, "U.S. Seeks UNICEF Funds Cut", The Washington Post, March 9, 1989, p. A5.

[30] Jessica Tuchman Mathews, Foreign Affairs, April, 1989 (not yet published).

[31] as reported in The Washington Post in March 1989 (I've lost the article.) and confirmed by the Global Affairs Office of the CIA.

[32] Huntington, op. cit., speech at NDU Symposium, November 1988.

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